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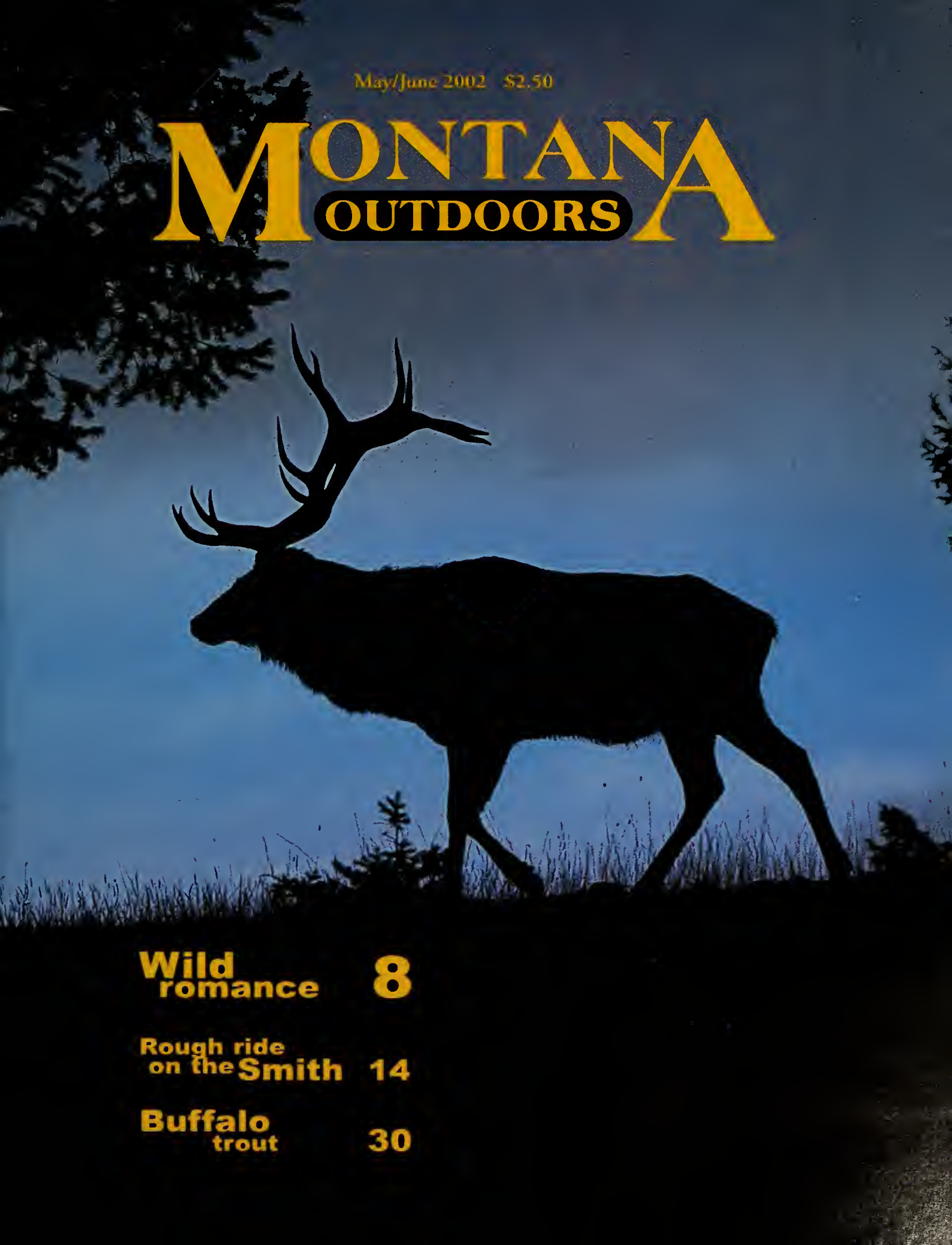
MONTANA OUTDOORS



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Rough ride on the Smith 14

Buffalo trout 30

Montana Fish, Wildlife & Parks

MONTANA OUTDOORS

MAY/JUNE 2002 VOLUME 33, NUMBER 3

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Letters

Bev Doolittle Dept.

Okay, how many elk *are* there on pages 18-19 of the Jan.-Feb. 2002 issue? I see 11, but then there's maybe another nose and another belly or body, and....

Don Reid
Placerville, California

W. STEVE SHERMAN

Editor's reply: *Many readers wrote, called, or e-mailed asking the same question. We passed the photo around at a FWP meeting and came up with counts ranging from 10 to 16. Then we called photographer Steve Sherman and asked him. "I count twelve: eleven cows and one bull," he said, but he conceded that there could be a few more. We've boxed in white those 12 we're pretty sure are elk and boxed in red those that also could be elk (or may be stumps).*

Not the best message

Regarding the article about paddlefish in the March-April issue: I enjoyed learning about this strange and interesting fish. Unfortunately, only one of the four men in the boat is wearing a life jacket. The water appears rough and there is definitely a risk of falling overboard. This is not a good message to send out to readers, who we should be encouraging to wear personal flotation devices (PFDs) whenever possible.

Tom Lowe
Assistant Park Manager
Bannack State Park

Editor's reply: *Tom Lowe makes a good point. For the record, Montana boating laws state that wearable, U.S. Coast Guard–approved PFDs must be available for each occupant of any boat. If the boat is less than 26 feet long, kids under age 12 must wear their PFD at all times. Adults aren't required by law to wear PFDs, but water safety experts recommend doing so, even in summer.*

We welcome your comments and letters to the editor. We'll edit letters as needed for accuracy, style, and length. Send your letter and a daytime phone number to: Montana Outdoors, P.O. Box 200701, Helena, MT 59620-0701. E-mail: tdickson@state.mt.us.

Sorry to bother you during dinnertime, but I'm calling on behalf of...
...and I'd like to ask you a few questions about your long-distance provider...
Hello? We're conducting a brief survey as part of a study on...

Nuisance Wildlife

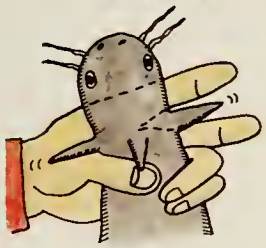
Natural Wonders

Q. *Can bullheads and catfish sting you with their whiskers?*

A. No. All catfish and bullhead species have four pairs of whiskers, or barbels, lined with sensitive nerve endings, similar to taste buds. They allow the fish to find food in dark, muddy water.

The "stinging" that some anglers encounter comes when they accidentally stab themselves with the sharp spines on the leading edge of the fish's dorsal (top) and pectoral (side) fins. When alarmed, the fish raises and locks these spiked fins. A catfish or bullhead can't actually stab with these fins, but you can poke yourself. As is the case with other sharp-spined fish, the puncture often gets infected, causing it to hurt and swell.

The Buffler Method



According to Rob Buffler, co-author of the roughfishing bible, *Fishing for Buffalo*, the safest way to handle a catfish or bullhead is to keep your palm on its belly and slide your thumb under one pectoral fin and your forefinger over and middle finger under the other.

Q. *What's the difference between horns and antlers?*

A. Jim Williams, FWP regional wildlife manager at Kalispell, says that deer and elk antlers are often called horns, but they are not. Horns, found on male and female bighorn sheep, mountain goats, pronghorn antelope, and bison, are made of a material called "keratin," which is also found in claws, hooves, and fingernails. Horns are never shed and continue growing for the life of the animal. (The exception, notes Williams, is with antelope, which shed the outer black sheath of their horns each year and grow a new one in summer.)

Antlers, on the other hand, are made of bone, the fastest-growing bone in nature. Antlers are shed each winter and begin growing again in spring, when they are covered by a soft brown skin called "velvet." Only male members of the Cervidae (deer) family—which includes elk, moose, and caribou—have antlers, with the exception of the various caribou races, in which the female also is antlered.

Our Point of View

Montana Outdoors is not a political publication. Its goal is to provide information of use and value to Montanans and visitors interested in fish, wildlife, and state park recreation and management.

Recently, however, the magazine was inadvertently drawn into politics. The cover of the March-April 2002 issue featured an angler who is running for public office. The image was not intended to endorse the candidate but rather was selected for its clarity, vibrant color, and appropriateness to an article in the issue on cutthroat trout.

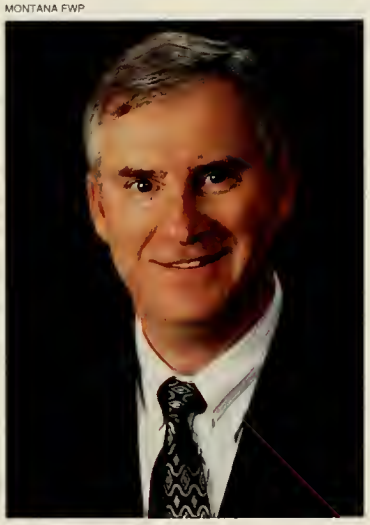
On hindsight we regret using that image. It was a mistake, but an honest one. I have reviewed the matter with my staff and find the error to be the result of several unique circumstances. Be assured that there was absolutely no intent to benefit anyone or any interest.

Our policy at *Montana Outdoors* has always been and will continue to be to steer clear of politics. We do our best to publish accurate and objective information so readers can make informed decisions. All articles—especially those covering controversial issues, such as the Smith River story in this issue—are carefully reviewed for technical accuracy and objectivity.

We select cover photos and all other photography and art used in *Montana Outdoors* based on their value in supporting articles. Selection criteria include technical accuracy, photographic clarity, and color vibrancy. Our goal is to provide readers with images that convey the drama and excitement of Montana's natural world.

The March-April cover, which was taken in 1997 by a freelance photographer, was selected from among roughly 2,000 slides we received for that issue following a solicitation sent to freelance photographers.

MONTANA FWP



Though we have received relatively few comments on the cover—and those were mostly good-natured ribbing—we appreciate and agree with those who raised concerns that state agency magazines should not be used inappropriately. As far as we know, nothing like this has ever happened before with our magazine, and nothing like it will again. We have learned from our mistake and will now carefully inspect the identity of individuals included in photos used in the magazine.

We sincerely regret this mistake and any misunderstandings it may have caused.

—Jeff Hagener, Director

Montana Outdoors Report

Crazy about loons

Citizens from Eureka to the Blackfoot-Clearwater area are helping state and federal biologists conserve Montana's small but regionally important common loon population.

This summer the Common Loon Working Group, formed in 1999, will select two "loon rangers" to tour lakes where common loons nest. The rangers—college students hired for the summer through the FWP Parks Division internship program—will inform campers, boaters, and anglers about the need to not disturb the birds, especially when they are nesting. Studies by Lynn Kelly, founder of the Montana Loon Society, have showed that loons will not tolerate people coming within a few hundred feet of their nests, which usually sit along the shoreline of islands and peninsulas.

GAEL BISSELL

LOON RANGER: These student interns patrol lakes and encourage boaters to stay clear of nesting loons.

"During the critical period of May through early June," says Gael Bissell, a FWP wildlife biologist at Kalispell, "boaters and others water users can unknowingly scare loons off their shoreline nests, causing the birds to abandon their eggs."

Each spring the working group—composed of local residents, loon fans, and biologists with FWP and the U.S. Forest Service—places bright yellow signs in the water near loon nests on roughly 35 lakes throughout the northwestern part of the state. The rangers' job is to explain to lake users what the signs indicate and how to keep from disturbing loons, as well as to provide other information about loon behavior.

Montana has the largest population of breeding loons of any state (except Alaska) west of the Mississippi River. The roughly 60 to 80 pairs of birds that nest here produce 35 to 50 chicks each summer.

"Each year we're seeing more and more interest in loons," says Bissell, "especially from people owning homes and cabins on lakes where the loons live."

To learn more about the Montana Loon Society, call (406) 883-5797 or 677-3767

Fish records shattered

They came, they fished, they conquered. Last year seven lucky anglers caught fish larger than anyone previously had done in Montana for those species.

The first, and one of the smallest, came on April 23, 2001, when **Robert Garwood** of Havre caught a 1.6-ounce mountain sucker at Beaver Creek Reservoir, adding a new species to the Montana fish records.

On April 29, **Douglas Jordan** of Billings was fishing Thornton Pond when he felt something grab his worm. Minutes later, the Billings angler had netted the state record flathead chub, weighing 0.59 pounds.

Next was **Curt Zimmerman**, Wolf Point, who on May 19 hauled in a record 1.75-pound cisco, a cousin to the whitefish, from below Fort Peck Reservoir.

The records continued to fall as spring turned to summer. On July 24, while fly-fishing on Hauser Lake, **Deed DeGolier** hooked and landed Montana's largest-ever kokanee salmon, a bright silver fish that weighed 7.52 pounds.

It was difficult to actually weigh the next record, which was caught on July 30. **Brad Sullivan** of Billings was fishing Belt Creek with a worm when suddenly the line twitched. After setting the hook, Sullivan reeled in a state record mottled sculpin that weighed, on certified scales at the local meat market, .05 pounds, toppling the old record of .03 pounds.

The next record came in August, when **Josh Ahles** of Kalispell hauled in a 0.1-pound redside shiner while fishing Lost Lake. The final record fell on September 25, when **Mike Otten** of Lewistown caught a monster 6.45-pound smallmouth bass while fishing Fort Peck Reservoir, beating out the previous smallie record (which he shared with another angler) by just .05 pounds. Otten's fish was 20.25 inches long and had a massive girth of 17 inches.

MIKE OTTEN

ONCE AGAIN: Mike Otten with yet another state record smallmouth.

Congratulations all.

Sauger by Joseph Tomelleri

Naive about native fish

Montanans don't know much about native fish, but they care about conserving these indigenous species.

Those are among the conclusions of a recently completed survey of 1,500 Montana residents to learn the current level of knowledge about native fish species.

Increasingly, FWP and other agencies are working on conserving native fish—species such as bull trout, pallid sturgeon, and Arctic grayling that were not introduced to the state by humans.

Tom Palmer, who heads FWP's public information bureau, says the survey was intended to give the agency a "snapshot look at what people know about native fish and how they feel about these species."

Palmer says that biologists knew there was some confusion among anglers and others as to the difference between a wild fish (one not reared in a hatchery) and a native species. He and others in the agency have begun developing brochures and other information to raise public awareness about native fish.

"We need to learn how people feel about native species and how much they know about them, so we can gauge how to build our information and education programs," says Palmer.

Among the survey findings:

• Respondents weren't sure which fish species are native to Montana. For example, 65 percent incorrectly believed that rainbow trout are native to Montana, though most respondents correctly identified bull trout (67 percent) and westslope cutthroat trout (71 percent) as native.

• Nearly half (48 percent) of the respondents reported that they have heard or read little or nothing about Montana's native fish.

• An overwhelming majority (81 percent) indicated strong support for conserving Montana's native fish species.

• Support for native fish conservation declined, however, if it meant removing non-native fish.

• And yet respondents indicated that they believed the single most urgent issue facing the conservation of native fish was competition from non-native species.

"This is vital information for us," says Palmer, who notes that the final survey results will be available from FWP headquarters in early summer. "When we do another similar survey in the future, we'll see if our education efforts worked."

Duel to the death?

It's common knowledge that rival bull elk will joust, often causing injury to each other with the sharp tines of their antlers. But a duel to the death?

That, apparently, is what Jim Conner discovered last fall when he investigated a report of a dead bull elk in a farmer's field.

"Right away I feared the worst," says Conner, FWP game warden at Lewistown. "I figured it was an illegally killed elk and that it had been wasted."

But that wasn't the case. After examining the carcass, Conner says he was perplexed by the many puncture wounds on the animal's left side. Then he backtracked and found a maze of elk tracks indicating a fight. "It was a heavyweight battle," Conner says, "and what we were looking at was the loser."

Skinning the elk confirmed for Conner his suspicion. The elk's rib cage was lacerated with roughly one dozen large holes. "We could see the severity and damage that the winner's antlers did to this bull," he says. "One puncture went clean through the heart, indicating to me that it died quickly."

"It was a heavyweight battle," Conner says, "and what we were looking at was the loser."

According to Valerius Geist, retired professor of environmental science at the University of Calgary and a world authority on ungulate behavior, brutal battles between antlered ungulates are more frequent than commonly believed (though fatal fights are rare). Geist says that hunters rarely see the punctures on the deer and elk they kill because the wounds heal quickly and aren't visible during hunting season. ■

Caught in the act

By John Fraley

Any wildlife photographer will tell you how difficult it is to photograph a wolverine, mountain lion, or grizzly bear in the wild. Rare, elusive, and limited to remote locales, such wild animals have for years eluded capture on film. But thanks to a photographic contraption developed by Tim Manley, a Montana Fish, Wildlife & Parks biologist, wildlife researchers can routinely use remote cameras to take dramatic images of these and other reclusive species, which they then examine to learn more about wildlife populations and behavior. Dubbed the "Manley System," the photographic technique also works well on commonly seen species such as deer, and it has been particularly valuable for surveying wildlife over a wide area without anyone actually having to handle the wild animals.

A new example of how this photographic recording system is helping wildlife researchers comes from recent work done by FWP wildlife research biologist Carolyn Sime, who used it throughout the 1990s to effectively census white-tailed deer in thick coniferous forests, where deer can be difficult to count. In a recently completed 10-year-long study, Sime used the Manley System to estimate the size of a wintering white-tailed deer population in the Salish Range northwest of Kalispell. Manley's camera system allowed Sime to photograph previously marked and also unmarked deer, providing data she used to estimate the population in the area. The photos also yielded unexpected images. Sime not only captured deer and other wildlife on film, she also recorded domestic dogs chasing deer. Increasing numbers of dogs—some chasing deer—were photographed through the decade-long study period, verifying biologists' suspicions that roaming dog numbers were on the rise due to increasing home development around the winter range.

Manley, FWP's grizzly management specialist, originally devised the camera system for fun but then modified it for use in wildlife studies. His original system, first developed in 1987, consisted of a motion sensor that tripped the shutter of a standard 35 mm single-lens-reflex camera hooked to a motor drive. Manley says he was just "fooling around" with the equipment, trying to photograph wildlife without having to spend hours waiting for animals to show up. But then he realized that if he produced many miniaturized versions of the system, he could use them to observe grizzly bears over a wide area, which was something he and other research biologists had been unable to do. "I knew that this would be a great way to 'capture' grizzly bears and other wildlife without actually having to handle them," says Manley. He explains that whenever bears are handled, such as after they have been tranquilized, the bears or the biologists could be injured.

Manley found that he could use a compact 35 mm camera with the shutter release modified so that it would trigger with the signal from a passive infrared sensor, which covered a specific area. Whenever motion was detected, a switch was tripped and the camera fired. He pointed the camera toward bait, such as a road-killed deer, hung high from a tree limb. A bear lured to the smell triggered the camera and was captured on film.

Researchers then examined photos of the grizzlies, some of which had previously been captured and fitted with neckbands or radio collars, to learn which bears were traveling to various sites and how often. Manley explains that images from the cameras allow researchers to compare the ratio of marked and unmarked animals, providing information needed to estimate the population size in a particular area.

A FWP biologist's innovative camera system effectively yet harmlessly captures reclusive wildlife for study

Through trial and error, Manley found a battery and flash system that lasted for a minimum of two weeks. To protect the components from wildlife and the elements, he housed them in a metal ammo box. Dozens of these units were used successfully for FWP grizzly bear studies conducted through the mid-1980s and early 1990s in the South Fork of the Flathead River drainage.

Manley's system caught on quickly among other wildlife researchers because it offered a risk-free, "hands-off" method of following the movements of marked animals. The system also offered opportunities to record visual evidence of reclusive species that researchers rarely see.

Over the years, Manley built approximately 300 units that were used to photograph a variety of western United States wildlife, as well as Siberian tigers, Asian bears, and other species throughout the world. In 1994, he and other researchers published a report on the method in *The Wildlife Society Bulletin*, and the Manley System was featured in a book on wildlife survey methods published the following year. The research biologist notes that many of his systems are still operating, some 15 years after being built.

"This camera system fills a niche in wildlife research," Manley says. "It can be quickly deployed at baited sites over a wide area, it's inexpensive, and it makes physical recapture of marked animals unnecessary."

Eventually, Manley's increasing responsibilities as a wildlife biologist prevented him from building any more of the remote photographic devices, though currently several companies manufacture units similar to Manley's.

Manley's remote camera system has saved wildlife researchers in Montana and elsewhere thousands of hours that would have been required to wait and manually photograph secretive wildlife. It also has been more effective—in a diversity of situations—at monitoring wildlife populations than previous methods, such as netting, while causing no stress to the animals being surveyed. Moreover, the Manley System produces striking photos of natural wildlife behavior (and often some eerily intimate images, such as the mountain lions above). All this from a backyard project begun simply for fun by a young FWP biologist. ■

John Fraley, an FWP information officer based in Kalispell, is a frequent contributor to Montana Outdoors.

I can feel the sound *on* my ears before I hear it *in* them: concussive waves of air against my skin and then the slow, resonant thumps that bump against my ear drums to become a hollow whir. It's a ruffed grouse, a male on a log, "drumming" for the attention of a female he cannot see. He beats out a message with his wings: "Hey, honey, I'm over here." Where I live in southwestern Montana, drumming is the sound I associate with spring

An entirely different sound ushers in fall. It's a weird, almost comical cross between a growl-like roar and a high-pitched squeal. Someone with a sense of humor or a tin ear once dubbed it "bugling," and the term caught on. Bull elk bugle to advertise their sexual prowess to cow elk and to either intimidate other males into skulking off or to egg them into a fight.

Drumming and bugling form some of the dramatic music of animal courtship. And animal courtship is a display to hear and behold. Would-be mates dance, strut, and fight. They show off their finery and their property. They sing and bellow and offer things to eat. They change colors. They build homes. They bully and they fawn. They leave scented notes and amorous signs. All to attract, win, and mate

Wild ROMANCE

By Sam Curtis

"Birds do it, bees do it, even educated fleas do it...."

DRUMMING MALE RUFFED GROUSE BY DONALD M. JONES

with a suitable partner.

The timing of courtship is anything but haphazard, particularly in regions with distinct and dramatic seasonal extremes such as those in Montana. Due to evolutionary adaptations, individual species respond to environmental changes such as decreasing daylight hours, changing moon phases, fluctuating temperatures, or precipitation increases. These external stimuli help synchronize courtship, and therefore birthing schedules, with times of the year that are favorable for the survival of both mothers and their young. In other words, animals time courtship and mating (usually in spring) so that their young are born when food is likely to be plentiful and the weather moderate—which, for most species, means summer.

Chemical attraction

On its most basic level, courtship is a single signal encoded in a chemical package, called a pheromone, sent out into the world for a potential partner to taste, smell, or absorb. And that may be all it takes to bring male and female together to mate.

Some underwater sea creatures use electrical impulses to attract a mate; others use fluorescent markings that glow in the dark depths of the sea. In the air, the initial attraction of a male to a female mosquito is triggered by the slower frequency of her wing beats, which the male detects with the hairs on his antennae. (Because males beat their wings faster than females do, they aren't drawn to each other.) But the award for communicating a lot with a little must go to lightning bugs. They can actually distinguish the species, sex, and willingness to mate of another lightning bug by the color, timing, and frequency of its illuminated message.

Sound, of course, is a major attractor during the courtship of many animals. Frogs croak their amorous intentions, and biologists have found that whales and porpoises actually "talk" to each other about mating. Often, an animal conveys much more in its mating sound than just "Hey, you, here I am." A bull elk's bugle, for example, carries in its pitch and frequency a clue to the animal's size and relative social rank among other bulls. A large, mature male has a deeper voice than that of a young bull, and he bugles more frequently. His bugling may inhibit the advances of younger males while advertising to females a potential mate who has physical and social dominance over other bulls. Such traits are desirable to a cow, which after mating would pass them on to her offspring to help improve their odds of surviving.

PHIL FARNES

SLICK ADVERTISING? Some biologists believe that males of certain species, such as sage grouse, invent their gaudy display to dazzle the female into romantic acquiescence. Other scientists maintain that a male's flamboyance, such as the bugling and large antlers of a bull elk, is simply a way to indicate he's a sensible biological choice for the female.

Choosing one mate over another is at the root of all the flamboyance and fanfare seen in courtship displays. It is the male, in most cases, who struts his stuff and the female who chooses to take him or try elsewhere. The widely held theory explaining this arrangement centers on the relative number of sperm and eggs that males and females produce in a lifetime, and how these ratios influence male and female courtship strategies.

The presumed biological goal of both a male and a female member of any species is to produce as many survivable offspring, with his or her genetic imprint, as possible. Because a female of any species produces far fewer eggs than a male produces sperm, she has to be far more selective in choosing a mate. In his book *The Dance of Life: Courtship in the Animal Kingdom*, Mark Jerome Walters notes that a female giraffe might expect to produce just a few hundred eggs in a lifetime, only ten or so of which will ever become fertilized. And a female sperm whale will produce just six baby whales in her lifetime.

. . . the more information a male can put on display to indicate that he is a good choice for a female, the better his chances of being selected as a mate.

Yet a single male of these and other mammal species, including humans, will produce billions of individual sperms in his lifetime, theoretically enough to fertilize billions of eggs and

DONALD M. JONES

produce billions of young.

Because a male has very little invested in each sperm, he can afford to spend them lavishly in an attempt to maximize his genetic imprint by mating with any agreeable female. A female, on the other hand, has quite a bit riding on each egg. She needs to choose a mate who can contribute the kind of genetic stamina that will give her eggs the best chance of becoming healthy, long-lived offspring. The end result, the theory goes, is that males tend to be showoffs, while females tend to be choosy.

Therefore, the more information a male can put on display to indicate that he is a good choice for a female, the better his chances of being selected as a mate. The bull elk bugles to indicate his size and social standing. He displays his big antlers to show the healthy diet and good genes that went into their growth, and he uses those antlers to fight with rivals to prove he has the physical stamina and survival strategy to dominate.

Equally flamboyant in their courtship displays are male sage grouse, which each spring gather at a display arena, called a "lek," to put on a gaudy show of fanning tails, inflating breast air sacs, and making loud "popping" sounds. The generally accepted theory of this display is that males are vying for the attention of females, which visit leks to compare males and find a superior mate. The process has been compared to medieval jousting tournaments, where each knight fought to stand out among rivals before an admiring crowd.

Yet Walters notes in *The Dance of Life* that all this falderal could very well be a scam (or, in the words of Shakespeare, " full of sound and fury, signifying nothing.")

Writes Walters: "Some biologists... have begun to doubt the fundamental assumption that there must always be an underpinning of 'rationality' in the designs of nature. They suggest that the females may simply be 'dazzled' into choosing the male who has invented the most elaborate eye- or ear-catching performance. In other words, she is influenced by slick advertising to choose a male of good form rather than proven substance."

This argument implies that males with nothing more to offer than sperm, and that don't stay around to help raise the young, often are the most showy and flamboyant in their courting. Conversely, males with more subdued courtship tactics may in fact be more worthy, or at least more helpful, to the female.

Take the male common tern, for example. He shows his parental worth by catching a fish and offering it to his intended mate to prove his ability to feed the family. Other male birds present sticks, grass, or pebbles as nest-building material to show they can provide a home.

On the other hand, the male of some animal species can be downright passive in courtship, leaving the female to devise a test for evaluating his worth. Dr. Charlotte A. Hosie, in the "Courting Rituals" chapter of *Animal Behavior* (edited by Tim Halliday), writes that a female North American red-backed salamander will "sample a male's feces by 'nose-tapping': pressing the snout repeatedly into the droppings. These salamanders prefer to eat juicy thin-skinned termites, which are a richer food source than the hard-skinned ants they may also take. Females can discern the contents of males' diets by nose-tapping their droppings, preferring those that have been feeding on termites."

RODNEY SCHLECHT

NO GENTLE EMBRACE: The male of many toad and frog species, such as the western toad, mate by roughly grappling the female and then depositing his sperm on top of the eggs she lays.

Mood music

Once courtship rituals have helped potential mates find each other and choose partners, there is still the matter of readiness. That's why courtship displays are also necessary to stimulate in couples a desire to mate.

A male brown trout, for example, takes little interest in a female until she begins using her tail to fan a depression in stream bottom gravel where she can deposit her eggs. This act, called "cutting," appears to stimulate the male, which then swims alongside the female and "quivers," an act that, in turn, stimulates her. The male trout's quivering increases in frequency and intensity until the female, opening her mouth to a gape, releases her eggs in the gravel depression. Simultaneously, the male squirts his milt over the eggs. Thus are brown trout made.

Sam Curtis is a freelance writer based in Bozeman.

One of the most spectacular bits of choreographed foreplay is performed by western grebes when a male and a female skitter across the water in unison—necks curved like commas, feet beating up a spray—and then dive together beneath the surface at precisely the same moment.

DON ENGER

RUSHING INTO LOVE: Western grebes conduct a captivating courtship display, called "rushing." When a male and female pair up, they arch their necks and race swiftly across the water's surface for 20 to 30 yards before diving, only to resurface and repeat the activity again and again. Male and female salmonflies and other stonefly species make no courtship display, but they do call to each other using vibrational sounds called "drumming."

Many frog and toad species, on the other hand, mate using a brutally crude sexual hug called "amplexus." And then there's the male North American two-lined salamander, which grapples the female while secreting a sex stimulant from his chin gland onto her. He then lacerates his mate's skin with his teeth so the secretion flows into her bloodstream.

For the truly bizarre in animal courtship, consider the mating habits of snails . . .

But for the truly bizarre in animal courtship, consider the mating habits of snails, as told by Lorus and Margery Milne and Franklin Russell in *The Secret Life of Animals*: "Two snails circle each other for an hour or more as a prelude, apparently, to the firing of what may be called love darts. Both snails produce these tiny, sharp darts, which are about a centimeter long and are made of a carbonate of lime. The dart is fired by a propellant that is stored in a glandular chamber just behind the creature's eyes; the snail makes a slight hissing sound as it ejects the dart. The love darts apparently have something to do with synchronizing the mating process. The first creature to fire the dart becomes temporarily passive, while the other snail continues to show its desire by circling before it, too, ejects a dart. This strange foreplay is mutually exciting and eventually leads to copulation...."

Clearly, courtship displays run the spectrum from sublime to ridiculous, but they all have a common goal: to bring together two different genetic contributions, in the form of an egg and sperm, that will combine to produce offspring that have a slightly different genetic makeup from that of their parents. And it is this very capacity for genetic change in each succeeding generation that forms the basis of evolution in all species on earth.

And who says romance is dead? ■

LARRY G. ARNOLD

ROUGH RIDE

ON THE SMITH

Here's what happens when an increasingly popular public floating river cuts through predominantly private land

By Tom Dickson

TIM EGAN

For much of its length, the Smith River in central Montana flows smoothly, with hardly a ripple disturbing its quiet surface. But in recent years, this scenic coldwater tributary of the Missouri River has become more turbulent—not from rapids, but from controversy surrounding its use by recreational floaters.

The sources of this conflict show up clearly on a river map (see page 17). The Smith rises from headwaters in the Castle and Little Belt mountains and flows 100 miles north to meet the Missouri 10 miles

DALE C. SPARTAS

E. NEALE STREEKS

PRIVATE LAND, PUBLIC WATER: Most Smith River shoreline is in private hands, yet the river itself is a public resource. Over the years, landowners have complained of trespassing, trash, wildfire threat, and tree damage from firewood collection. Floaters, in turn, have bristled at what they consider special floating privileges granted to private landowners by the state.

west of Great Falls. Roughly 30 miles past the town of White Sulphur Springs, the river cuts through a deep limestone canyon, where it begins to twist and turn through some of the most breathtakingly beautiful scenery in the state.

"We've floated a lot of rivers," says Diane McDermand of Great Falls, who regularly canoes the Smith with her husband and other family members, "and this really is one of the grander sights in Montana."

The most popular stretch for canoeing and rafting begins at the Camp Baker launch. From there north, almost all of the river's west bank—and much of the east—is privately owned. Roughly 80 percent of the property is in the hands of several dozen landowners. The remaining 20 percent is public land, mostly held in the Helena and Lewis and Clark national forests. Half of the 27 campsites sit on the national forest property, eight are on state land, and five are on leased private land.

Land ownership is one reason the Smith River can run high with emotions. Whenever a popular public resource abuts private property, conflicts can ensue, and the Smith is no exception. Over the years private landowners have complained of trash, trespassing, wildfire risk, and, most recently, state restrictions on their use of the river. Meanwhile, floaters have chafed over what they consider special privileges granted to private landowners by the state.

Though Montana Fish, Wildlife & Parks is responsible for managing recreation on the Smith, the agency owns only a tiny fraction of the shoreline. To manage the river, it must work cooperatively with the larger private and public landowners—including federal officials—while meeting the needs of 4,000-plus floaters who flock to the Smith each year. Smith River management requires cooperation among parties that often don't see eye to eye, further complicating a complex recreational arrangement.

Another important feature of the Smith River landscape is the lack of roads and access points. From the Camp Baker put-in, floaters must travel 60 miles before the next public access site at Eden Bridge. The lack of access maintains the river's quiet and remote character. But it also means that a float can take up to five days to complete. For many people, a trip down the

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Tom Dickson is editor of Montana Outdoors

Smith River isn't a weekend getaway but rather their primary summer vacation. As a result, they take seriously any threats to their river recreation.

Floating pleasures and pressures

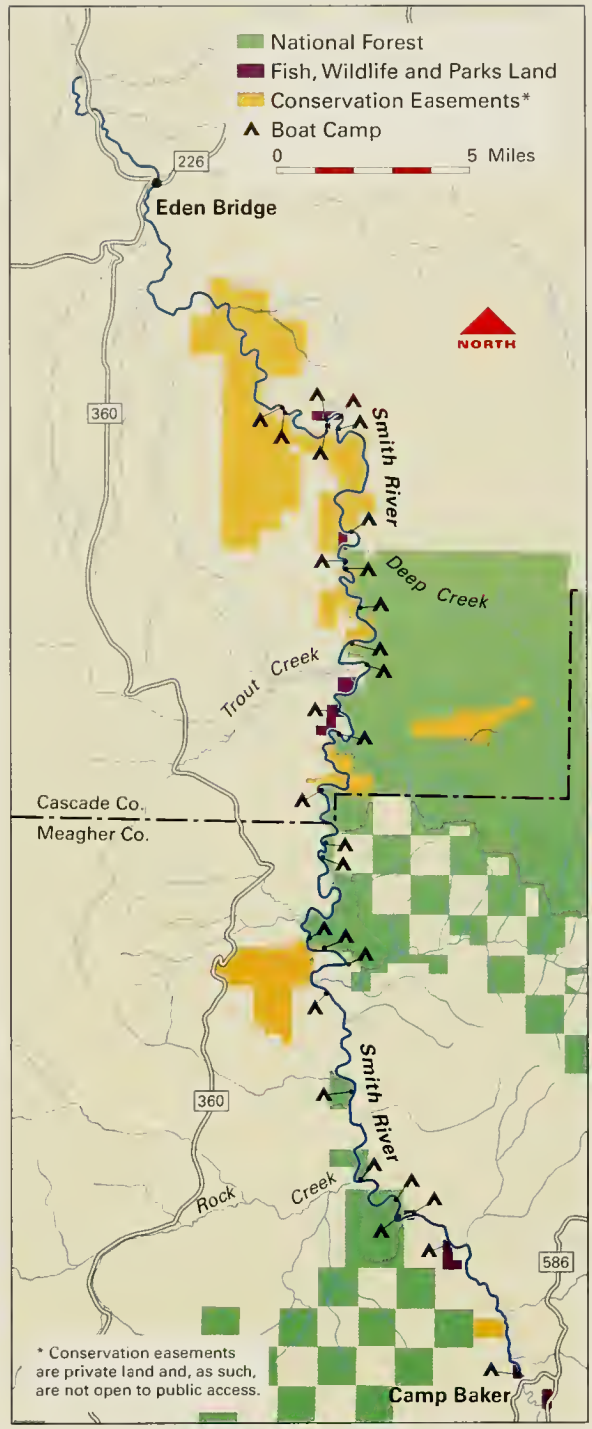
Named in 1805 during the ubiquitous Lewis and Clark Expedition for Secretary of the Navy Robert Smith, the river has long been known by anglers for its outstanding trout fishing. Beginning in the late 1960s, however, the Smith began attracting the attention of other river users too. In a near-wilderness setting, this clean and clear river snakes back and forth between steep, 1,000-foot-high limestone walls studded with tall ponderosa pines. Elk, mule deer, black bears, and a variety of birds live in the lush valley, which also contains Indian pictographs in caves high above the river.

Recognizing the quality of the Smith River and the floating experience it provided, the Montana Fish and Game Commission (as it was then called) designated the reach from Camp Baker to Eden Bridge in 1972 as a recreational waterway, prohibiting motors. The designation added to the river's popularity, which soon reached a point where FWP had to begin managing recreational use. Along the pristine river's shoreline, floaters were leaving trash and human waste, trespassing on private land, and crowding the most scenic campsites.

As landowner and floater complaints mounted, the agency responded by hiring rangers to patrol the river during peak season and then by working with the U.S. Forest Service to establish overnight campsites. In 1984, FWP's Great Falls regional office formed an advisory committee of landowners, anglers, outfitters, and recreational floaters to work out differences among themselves and advise the department on Smith River management.

As floating pressure continued to grow, so did the need for FWP to increasingly manage recreational use on the river. In 1988, the FWP Commission endorsed a management plan aimed at lessening conflicts, protecting natural resources, and maintaining the high-quality floating experience that visitors sought. The following year the state Legislature passed the Smith River Management Act, which for the first time gave FWP authority to regulate recreational floating on the river. Within a few years, the agency began requiring a fee and limiting group size, as well as the number of groups entering the river each day during the peak season from mid-June to mid-July, when high water levels make floating easier. "Those rulings made a big difference," says John Kowalski, an advisory committee member who has been guiding on the river since 1980. "After that, there was far less crowding and trash."

In addition, the agency granted several authorized outfitters roughly 10 percent of the available permits to purchase and sell to their clients. And it made some concessions to Smith River landowners, who were allowed to take day trips down the river without applying for a permit. Also, each day one landowner out of the several dozen total could personally take family members and up to six friends on a day trip (though overnight trips required applying for a permit like everyone else).



The letter

Though the river's popularity and use continued to grow throughout the 1990s, FWP appeared to have things under control. Floaters were happy, the resource remained in good shape, and landowners rarely complained. Then one day in 1999, Joe O'Neill received a letter. It came from one of the larger Smith River landowners, who wrote the FWP Smith River manager asking if the landowners' guests could float down the river accompanied, not by the landowners themselves, but by an employee of the ranch. FWP staff read through the state's rules for the Smith

and, after consulting with other state agencies, concluded that ranch employees did not qualify as landowners. The agency wrote back explaining that it would have to be the landowners themselves who accompanied guests wanting to float the Smith. FWP also sent letters to all other landowners clarifying what the agency contended they could and couldn't do regarding recreational floating on the Smith.

"Everything ignited after that," says O'Neill.

Several landowners insisted that the agency had no authority to regulate landowner use of a river running adjacent to private property. "For us this was and continues to be a private property rights issue," says Bill Galt, whose family has owned land along the Smith for several generations. "It doesn't have anything to do with recreational floating. In fact, I've never even floated this river."

But landowners weren't the only ones fuming over FWP's delineation of the state's Smith River rules. A growing number of anglers, outfitters, and other floaters criticized the agency for granting what they considered to be special privileges to landowners for a public resource.

"It eroded the principle of fair and equitable access," says John Gibson, president of the Montana Wildlife Federation. "It's like if I have a house across the street from a public tennis court. Should I have special privileges for using that court? Of course not. It's a public resource, just like the Smith is a public resource."

Landowner rights attorney Lance Lovell, however, questions such reasoning. "A more accurate analogy for [FWP's] ruling," he says, "would be if I owned a lake cabin on Flathead Lake and the state wouldn't allow me to have a right of access to that lake."

During the next year, agency staff met with landowners and others concerned about the state's position on the Smith. "This was and continues to be a really tough issue," says Jeff Hagener, FWP director. "We've been trying hard to find a reasonable solution by working with all the people who have concerns about the Smith."

In October 2001, the FWP Commission issued a tentative rule for public comment and then, last December, adopted new regulations for the popular river.

Few of the concerned parties, however, were happy with the outcome. Some landowners expressed disappointment that the commission let stand the provision requiring them to be on day floats taken by their guests. On the other hand, many floaters didn't like the fact that FWP commission members also expanded landowner use privileges to now allow up to three landowner-guest groups to launch each day for day trips. Like a raft pressed into a boulder by the current, FWP found itself caught between those advocating the rights of landowners and those pressing for recognition of public rights to a public resource.

26 miles of easements

Despite the controversy, most Smith River landowners seem more concerned about protecting the river from overuse and pollution than about securing property rights. "Many of us are trying to enhance the wild and scenic aspects of the river," notes Ned Morgens, the largest private landowner along the popular stretch of river. The Montana Land Reliance has obtained open-land easements on 26 miles of the Smith River, most donated by the Morgenses and other landowners who agree to give up development rights on the land in exchange for a nominal tax break.

"That's a helluva gift to the public from landowners," says Rock Ringling, a director of the nonprofit land conser-

GUIDELINES FOR RESPECTFUL RIVER USE

According to Joe O'Neill, FWP's Smith River manager, general rules for using the river are based on common sense:

Respect the rights of landowners: Don't trespass, don't litter, don't vandalize signs or trees. As a courtesy to landowners, don't stop in front of cabins. Anglers who wish to wade up a tributary stream to fish must stay in the stream. "There's simply no need for anyone to trespass on the Smith," says O'Neill.

Bring firewood: Don't collect it. Some areas along shore have been stripped of wood, and live trees have been damaged and killed. Floaters may purchase firewood at Camp Baker.

Use fire rings: To lessen the chance of wildfire, FWP and the USFS have installed dozens of fire rings at campsites. Keep your fire in the ring and be sure to extinguish it completely before leaving the site.

Use pit latrines: This summer, FWP and the USFS will install 52 pit latrines at boat camps along the river.

Pack out all food, trash, and litter: Littering is against the law, and it degrades the floating experience for others.

Respect other floaters and anglers: Many people consider the Smith River canyon a natural cathedral. Respect it similarly. Don't shout or play loud music. Float wide around wading anglers.

CONRAD ROWE

DALE C SPARTAS

DALE C SPARTAS

AT CAPACITY? Applications for the 760 group float permits available each year have grown from 216 in 1993 to 3,752 in 2002. Group size averages about six floaters, though groups of 10 or more (above) are not uncommon. By allocating roughly 10 percent of the permits to outfitters (far left) and encouraging floaters to bring their own firewood and douse fires (left), public agencies have reduced problems and conflicts among river users.

vation organization, "and one that doesn't get recognized very much."

Tom Reilly agrees that cordial relations among landowners, agencies, and the public are essential. The FWP Parks Division assistant administrator says the agency works with several landowners to maintain leases for campsites on private land, and it is now considering the purchase of additional easements to prevent new development from marring the landscape.

"Our plan is to use the nearly $250,000 collected so far in outfitter and permit fees to purchase additional conservation easements along the river," Reilly says.

The agency also continues to search for new ways to reduce user conflicts and river degradation. In recent years, FWP has allowed a private vendor to sell firewood at Camp Baker as a service to floaters and to reduce trespass, recruited volunteers who provide information and deter vandalism, and surveyed floaters to learn how they rate their experience. O'Neill, the agency's river manager, says most floaters continue to support FWP efforts to manage the river for a quality float. "The vast majority of comments we get are real positive," he says.

That could be in part because the recent drought has kept water levels low, lessening river use and reducing crowds. Last year only 2,262 people floated the river, compared to 4,823 in 1997, when water levels were at historic highs. "The first decent water year we get," says O'Neill, "we'll be back to near 5,000 floaters. And that's when we could really start to run into problems."

Based on the state's management plan guidelines on crowding, FWP would then have to find a way to reduce the number of people on the river. Options include reducing group size from the current 15 and cutting

DALE C. SPARTAS

back on the number of launches per day. "When we have to decide who gets cut and how we cut, that's where people could start to come unglued," O'Neill says.

Regulating use is one of the few activities on the Smith granted to FWP by the Legislature. Reilly notes that because half of all Smith River boat camps are on USFS land, "anything we do on the Smith needs to be done in coordination with the Forest Service."

Add to that the agency's need to work closely with landowners on leasing campsites, and it's clear the agency can accomplish little on its own. "FWP owns less than one percent of the shoreline along the Smith," Reilly says. "We can't just do whatever we want." Reilly adds that the agency will continue to rely on public input to help work out differences among users and public and private landowners.

The biggest unknown right now is the prolonged drought. Though Montana is long overdue for wet weather, forecasters predict continued dryness well into the summer.

What is certain, however, is that every year more and more people want to float the Smith, as Montana's residential and tourist population continues to grow. Unfortunately no one is making any new rivers—especially any as remote and beautiful as the Smith.

"Obviously everyone in this is trying to protect their particular interest on the river," notes Kowalski, the river guide. "But the main priority for everyone really ought to be protecting the Smith River corridor so we all can continue to have a quality experience." ■

GETTING ONTO THE SMITH

The best time to float the Smith is mid-June through mid-July, when water levels are highest, but this is also the river's busiest period. On the other hand, water levels in April and September are often high enough for floating, especially in a canoe, and crowds are fewer. But the weather can turn nasty then.

Other than by owning land along the shoreline, there are three ways to gain access to the Smith River canyon between Camp Baker and Eden Bridge.

1. Apply for a permit: Applications are due in mid-February, so it's too late for this season. Application forms for 2003 will be available from FWP offices in January. The permit costs $15 for residents and $35 for nonresidents, plus a nonrefundable $5 application fee.

2. Call for leftover launch dates during the float season. Beginning March 18, you may call the Smith River Hotline (406-454-5861) between 8 a.m. and noon to apply for permits that have been cancelled.

3. Hire an authorized outfitter. Twelve outfitters have been licensed by the U.S. Forest Service to take clients down the Smith River. For phone numbers, go to the FWP web site (fwp.state.mt.us) and type "Smith River" into the search function.

ILLUSTRATION BY MICHAEL SCHMIDT

Touring MONTANA by mouse

By Anastasia Burton

Thanks to a little-known state information program, fishing, hunting, and birding maps and data are now just a computer click away

For several years, the Montana Fish, Wildlife & Parks web site has offered maps of fishing access sites, hunting districts, wildlife management areas, and other jurisdictions. Though somewhat useful to anglers, hunters, and other outdoor enthusiasts, these maps had problems. They were difficult to update by FWP and other staff, and users could not zoom in to get more detailed information on a site.

Recently, thanks to its collaboration with a little-known division of the Montana State Library in Helena, FWP has begun to offer Montana and visiting anglers, hunters, and other recreationists some of the most sophisticated interactive maps available anywhere. These maps are not only easy to update and zoom into but are also more accessible for an even wider range of outdoors activities.

The unassuming entity responsible for the maps is the Montana Natural Resource Information System. This crew of technicians and scientists uses advanced computer technology to gather, store, and provide information about Montana's natural resources, particularly plants, animals, and water.

For years state agencies such as FWP have maintained computer databases containing massive amounts of information. But converting the raw data (for example,

VIRTUAL DEER HUNT: To use NRIS mapping information to find deer areas, go to the FWP web site hunt planner (left) and click "Deer." From there you'll be guided to the hunting district of your choice, where you can then view a variety of information ranging from deer distribution, land ownership, and road locations (below).

the location of elk wintering range along the Rocky Mountain Front) into visual maps was laborious and expensive. Recent improvements in Geographic Information System technology, however, have made it easier for agencies to unlock the geographic nature of their databases. GIS is a way of organizing data so that it can be analyzed in ways not easily possible before, such as by producing map "layers," each showing, for example, land ownership, topographic features, or wildlife ranges. One job of the NRIS is to use this information to create maps and other products that help natural resource agencies manage the state's tremendous natural resources and allow Montanans and visitors to enjoy these resources.

Today this service includes not only paper maps, but also digital maps available through the NRIS web site (nris.state.mt.us). With the click of a button, web site visitors can zoom in on roads, lakes, streams, and other topographical or land ownership features on hundreds of maps. The NRIS also works with FWP to provide wildlife information over the Internet, including fish data for all Montana rivers and streams, statewide distributions of bird species in Montana, and information on the state's rare and endangered species.

Born of fire

Because the NRIS is only partially funded by legislative appropriation, it relies on cooperative agreements with several state and federal agencies for much of its operating budget. FWP, for example, has worked closely with the NRIS on map and data projects since the system was established by the state Legislature in 1985. But as Janet Hess-Herbert explains, it took an act of nature to revise the FWP web site to include interactive mapping as a necessary addition.

"We really saw the power of interactive web applications during the fire season of 2000," says Hess-Herbert, FWP's web coordinator. "That's when [the] NRIS and our Conservation Education Division staff developed the Fire Page for our web site."

The massive outbreak of fires throughout much of western Montana that summer created a huge and immediate public demand for information. "The 'closed' status of public lands in Montana was changing almost hourly during the peak of the fires," recalls Duane Anderson, GIS chief for the Natural Resources Information System. "Fish, Wildlife & Parks was swamped with public requests for the status of its facilities and hunting districts."

The mapping system on the FWP web site at the time could not meet the demand. Agency staff were unable to quickly revise map data and provide it to citizens and visiting tourists. And web users could not obtain the mapping detail they needed to make informed decisions about which public lands to visit and which to avoid.

Anastasia Burton is a communications consultant based in Helena.

As the wildfires intensified, FWP quickly recruited the NRIS to develop and maintain a map showing the status of fires on lands across the state. The agency then deployed an interactive query system that allowed users to select a fishing access site, state park, or hunting district and quickly learn whether that area had been closed due to fire.

"In a two-week period in August [2000], the Fire Page received 63,000 queries," says Hess-Herbert. "It was so much in demand that we put a computer in the FWP headquarters lobby so people could come right in and check the status of fires. No other state or federal web site had this information."

Click here, hunt there

The experience gained from the Fire Page project eventually led FWP to develop an interactive hunt planner. This system allows hunters to select a particular hunting district for any big game species and retrieve hunting regulations, statistics, and, in most cases, species distribution for the selected area. New and revised hunting regulations are posted there, too. But of greatest value to hunters are new computerized maps.

For example, an elk hunter wishing to hunt District 360 east of Ennis can go to the hunt planner feature on FWP's web site (fwp.state.mt.us), click "Elk," click "3" on the state map, and then click "District 360." The options from there are almost limitless. The hunter can find elk distribution in the district, land ownership, road locations, and the most recent elk permit drawing statistics. The zoom feature displays detailed topographic features such as lakes, valleys, and ridges.

Another new web feature is of tremendous value to anglers and others who enjoy the water. The Montana Rivers Information System provides maps and information on fish species distribution and fishing pressure (for example, how angler presence affects fish populations). Hosted on the NRIS site, the rivers information system is maintained with FWP data.

This summer, FWP is launching an interactive fishing planner. Similar to the hunting version, this innovation will allow people to plan fishing trips from their home computers by retrieving information such as regulations and public stream access on waters across Montana.

The new web technology also makes it easier to find and learn more about birds. Bird watchers can now zero in on desired species using the Montana Bird Distribution Database, maintained by the NRIS Natural Heritage Program. The database contains reported bird sightings since 1960 and can be used to generate a list of birds that have been documented from any area of the state, in any month. A joint project of the NRIS Natural Heritage Program, FWP, and Montana Audubon, the resource works by clicking "Natural Heritage Program" on the NRIS home page, then clicking "Animals" and then "Species Distribution." Users interested in the American avocet, for example, can find a statewide map showing where the species breeds, among other information.

Super servers

Behind the scenes, the interactive and easily updatable nature of these applications is aided by the use of special computers, known as servers, housed in the NRIS. One server provides storage for map data and other information. Another server processes the raw data—essentially, the lines and points that define rivers, road boundaries, and other features—and composes them into a map. Other servers direct the entire process. A small and efficient team of NRIS and FWP staff, all working together in the NRIS facility, manages this technology.

According to Jim Hill, NRIS director, the collaboration is a good deal for taxpayers. "This way, FWP doesn't have to invest fully in the specialized software, computers, and infrastructure that it would need if it had to provide all these service to the public by itself," he says. "And [the] NRIS receives some of the funding we need to keep this valuable resource working."

The biggest benefits of the FWP-NRIS partnership, adds Hill, go to Montanans and state visitors. "Hunters and anglers now have more information on where to hunt and fish, and birders can learn more about the species they want to see," he says. "Meanwhile, we're able to continue gathering, analyzing, and providing access to a wide range of natural resources data from throughout the state." ■

By Dave Hagengruber

Why FWP wants to get kids hooked on fishing

making young fishing FANATICS

It's late May, and the students in Mike Sartori's seventh- and eighth-grade class at Trego School fidget in their seats. Summer vacation is just around the corner, and the kids are literally sweating out the last few days of school in the hot classroom. A few years ago, many of these youngsters would have been dying to pick up a fishing rod about now. But Sartori's students have already been fishing and studying fish all year. In fact, their angling activity actually began when they entered the classroom last fall, not when they will leave it this spring. Fish and fishing are integral parts of the entire school year, topics discussed in class almost every day.

The same is true in other classrooms across Montana. Throughout the state, a growing number of students are learning about fish, fishing, and aquatic resources through the Montana Fish, Wildlife & Parks Hooked on Fishing Program. During the recent school year, more than 100 classrooms and 2,500 students, mostly in the upper elementary grades, took part in the interactive fishing education program.

Hooked on Fishing got its start in Montana in 1996, when FWP was looking for new ways to encourage families to spend more time together outdoors. That year, Montana adopted a national program called Hooked on Fishing, Not on Drugs. The Montana version has no formal anti-drug references, but it does offer fishing as a positive alternative to drug use and other activities that could get kids in trouble. Funding comes from a federal excise tax paid by anglers and boaters on fishing gear, boats, and motor fuel.

Why does Montana, a state with one of the highest fishing participation rates among residents, need a program to teach youngsters about fish and fishing? Because each year, fewer kids have opportunities to go fishing and learn about the natural world on their own. Increasingly, kids grow up in towns and cities without access to streams and ponds available to earlier generations.

GARY KRAMER

What's more, kids today have many more recreational options, such as soccer and video games. As a result, fewer kids are exposed to fishing.

That's a shame, say Hooked on Fishing supporters, because fishing is an enjoyable lifelong activity that every Montanan should have the chance to experience. And because active participation in the outdoors creates more advocates for conserving the outdoors, that potential loss of anglers could mean fewer Montanans who care about conserving fish habitat and water quality in the future.

"These students are the future voters and sportsmen and sportswomen of Montana," says Sartori, the middle school educator. "This program teaches kids responsible stewardship of our resources. There is so much more to it than just hooking up your rod and going out to have a good time."

Sampling pH

Located in Lincoln County north of Whitefish, Trego is an ideal place for Sartori's seventh- and eighth-graders to learn about fish and fishing. Within a short drive of the school are more than fifteen lakes and four rivers, any of which the class may visit several times each month. And not just to fish. The students also sample for water quality on local rivers and streams and monitor water temperature, oxygen levels, pH, and dissolved solids. After adopting a short stretch of a nearby creek, they worked with staff members of FWP and the U.S. Forest Service to stabilize the stream bank and improve spawning habitat. Each winter, Sartori's class leads a schoolwide ice fishing trip, in which all of the school's 65 students spend a day learning about—and taking part in—the outdoors.

Though Sartori's students have discovered that they won't catch fish on every outing, there have been days when the fish wouldn't stay off their hooks. For example, last year while ice fishing with FWP instructor Roy Hassinger, the class caught more than 1,200 yellow perch in one afternoon. Most of the fish were released, but some were cooked and eaten on the frozen lake. Others were saved for classroom study on anatomy and dissection later in the spring. On this and other fishing trips, the students kept careful records of the numbers and size of the fish they caught, the weather and water conditions, and the amount of time they spent fishing.

The outdoors action is fun, but most Hooked on Fishing activities actually take place indoors, in classrooms. Each of the 100-plus participating Montana teachers uses the program a bit differently, but most of its components are the same for all classes. The program provides fishing equipment for every student and training and curriculum for the teachers, as well as in-class assistance by FWP staff and instructors.

In the classrooms, fish and aquatic resources become a theme for the school year. The connections to science studies are obvious, but Sartori and many other teachers find ways for fish and aquatic resources to show up in almost every subject area.

"We do lots of math," says Sartori, "especially with our water monitoring and river flow calculations. And students write about all of these activities in their journals. We've even had fish show up in our art projects."

That sounds fun, but does the program benefit students academically? For Jan Thon, recently retired third-grade teacher and Hooked on Fishing instructor in Kalispell, the answer is clear. "When I was teaching, this was one of the very best programs I had ever been involved with," says Thon, who taught for 31 years before retiring in 2001. "I was able to reach students I had never been able to get close to, just by sitting together and fishing on the bank."

Like Sartori, Thon worked fishing into every subject matter. "Our class made graphs of weights and lengths of all the fish we caught, and we even wrote fishing math story problems," she says. "That was one of the only ways I could get my students to actually enjoy math class."

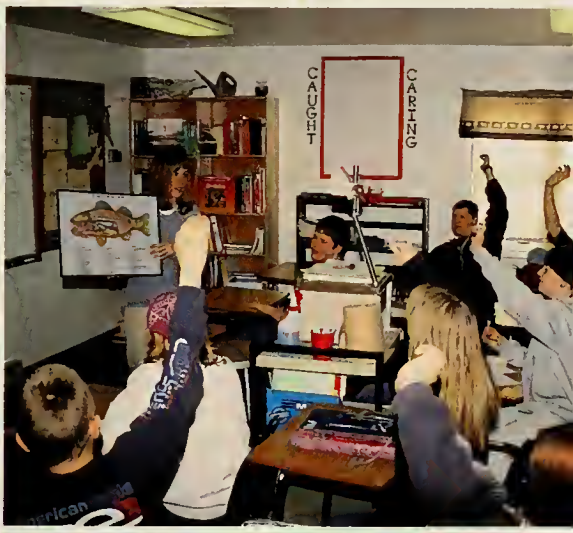
The program had added benefits beyond writing and arithmetic. "My favorite thing about fishing," says Thon, "is that it's a non-competitive sport. Every student in my class was successful. And without them realizing it, fishing helped them learn lifelong skills—things that all of us who fish just

MONTANA FWP

YOUNG BASS MASTER: Kids who learn about fish are more likely to become adult advocates for conserving aquatic resources, say Hooked on Fishing supporters.

MONTANA FWP

Dave Hagengruber is FWP's angler education specialist.



DAVE HAGEN

SCHOOL OF FISH: At outdoor Hooked on Fishing clinics, kids learn to cast lures and identify underwater insects. Indoors, more than 100 Montana teachers statewide work fishing into science, writing, art, and even math classes.

JEFF HENRY

"I've had dads come in to work with my class during their lunch hour..."

take for granted. Fishing teaches concentration. It teaches patience. Those are critical skills that many kids today don't have that fishing helps them develop."

Unlike Thon, an experienced angler, most teachers using Hooked on Fishing lack fishing skills. Volunteers and FWP staff provide much of the technical expertise for the classrooms while teachers handle the daily lessons. John Fraley, FWP information officer in Kalispell, is responsible for 75 Hooked on Fishing classes in the state's northwest region and coordinates several volunteer instructors who assist in the classrooms.

"Without the help of our instructors, we wouldn't have a successful program," says Fraley. "Each one is assigned to work with a teacher at the beginning of the year, and they and the students really get to know each other well by the year's end."

Volunteer instructors teach many of the technical lessons, such as insect and fish identification, fish dissection, and lure making. "Our instructors have the skills," says Fraley, "but we rely on the teachers for their experience with the kids and knowing how to incorporate the subject into their classes."

It's an ideal partnership between FWP and the schools, says Fraley: "Best of all, the kids are the ones who benefit."

And far more kids are benefitting than what FWP had been able to reach previously. Before Hooked on Fishing began, Fraley ran only one angler education class each year, with the help of volunteers and agency biologists and wardens. "A good-sized class for us was about 40 kids," says Fraley, "and we put a lot of time and effort into that one class." Now Fraley works directly with dozens of teachers, who each teaches 20 or 25 kids every year.

"We are reaching over 1,800 kids each year in this region alone," Fraley says.

Moreover, the amount of education each student receives is far greater than what FWP was able to provide previously. Teachers in the program report spending an average of more than 40 hours of classroom time each year on the topic of fishing and aquatic resources.

"We never had that kind of impact on our own," says Fraley. "Forty hours is a tremendous amount of classroom time."

Dads in the classroom

Students learn even more when that amount of quality instruction is complemented by parental involvement. "One of the neatest things I've seen," says Susan Kalanick, who teaches third- and fourth-graders at Greenfield School near Great Falls, "is the number of dads who show up in my classroom now." Kalanick, who has been involved with Hooked on Fishing since 1997, says the program attracts fathers who ordinarily wouldn't spend time in the classroom. "It's something they feel comfortable with," she says. "I've had dads come in to work with my class during their lunch hour or take time off work to fish with our class. I've never seen this level of parent involvement before."

Kalanick reports on another new development related to the program. "I now have girls who come into school and talk to their friends about going fishing over the weekend with their family," she says. "I love seeing the girls get

involved with fishing."

Kalanick believes fishing provides an alternative to harmful activities such as drug abuse. "It gives these kids something to do," she says. "It's a productive way [for them] to spend time away from school without getting into trouble. The activities we do in class help them develop an interest in many areas and learn the skills they need to go out and enjoy fishing on their own."

Recent national studies bear out Kalanick's observations. A 2001 study by Cornell University showed that students participating in the Hooked on Fishing Program were more likely to become environmental stewards. Another by the National Institute on Drug Abuse showed that teaching positive life skills, such as those promoted in Hooked on Fishing, significantly lowers the incidence of drug use later in life.

Pat Volkmar, an industrial technology teacher from North Middle School in Great Falls, doesn't need a study to prove that fishing can keep kids out of trouble. He has learned it firsthand.

"I'm one of those guys," says Volkmar, "who would have ended up in prison if I hadn't been able to go fishing during my school years."

Though never a team sport player, Volkmar says he was always good at fishing and as a teen spent most of his free time carrying a fishing rod. "Instead of stealing hubcaps and breaking windows," he says, "I was sneaking around ponds trying to catch fish."

Because Volkmar thinks fishing is just as important to some of his students, he volunteers as an advisor in an after-school fishing club. The group meets every other week and goes fishing one Saturday each month. Currently, about 20 students attend the meetings and club outings.

According to Volkmar, few of the kids in the club had previously taken part in any school-related activities. "I've seen too many kids who just drift off after school ends," he says, "and that's often when trouble begins." For some in the club, he adds, fishing has become a skill that ignites a spark, motivating them to concentrate, to practice, and even to excel. "You should see some of these kids with a rod in their hands," Volkmar says. "It's like magic." ■

Editor's note: For more information on the Hooked on Fishing Program, call (406) 444-9736.

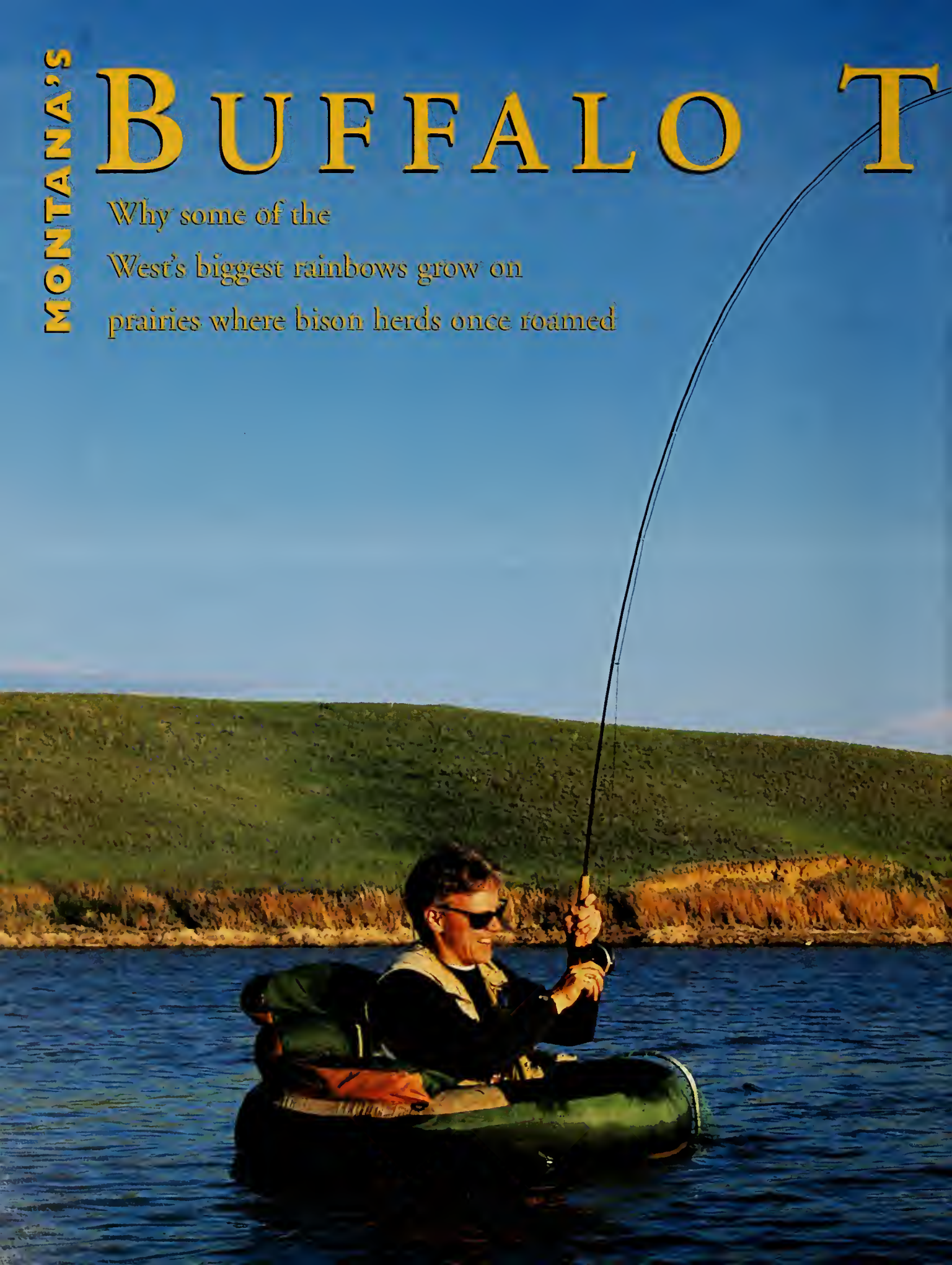
KAREN NICHOLS

NAILED ONE: Hearing girls swap fishing stories like they'd trade fashion news delights Great Falls teacher Susan Kalanick. "I love seeing the girls so involved with fishing," she says.

MONTANA'S

BUFFALO T

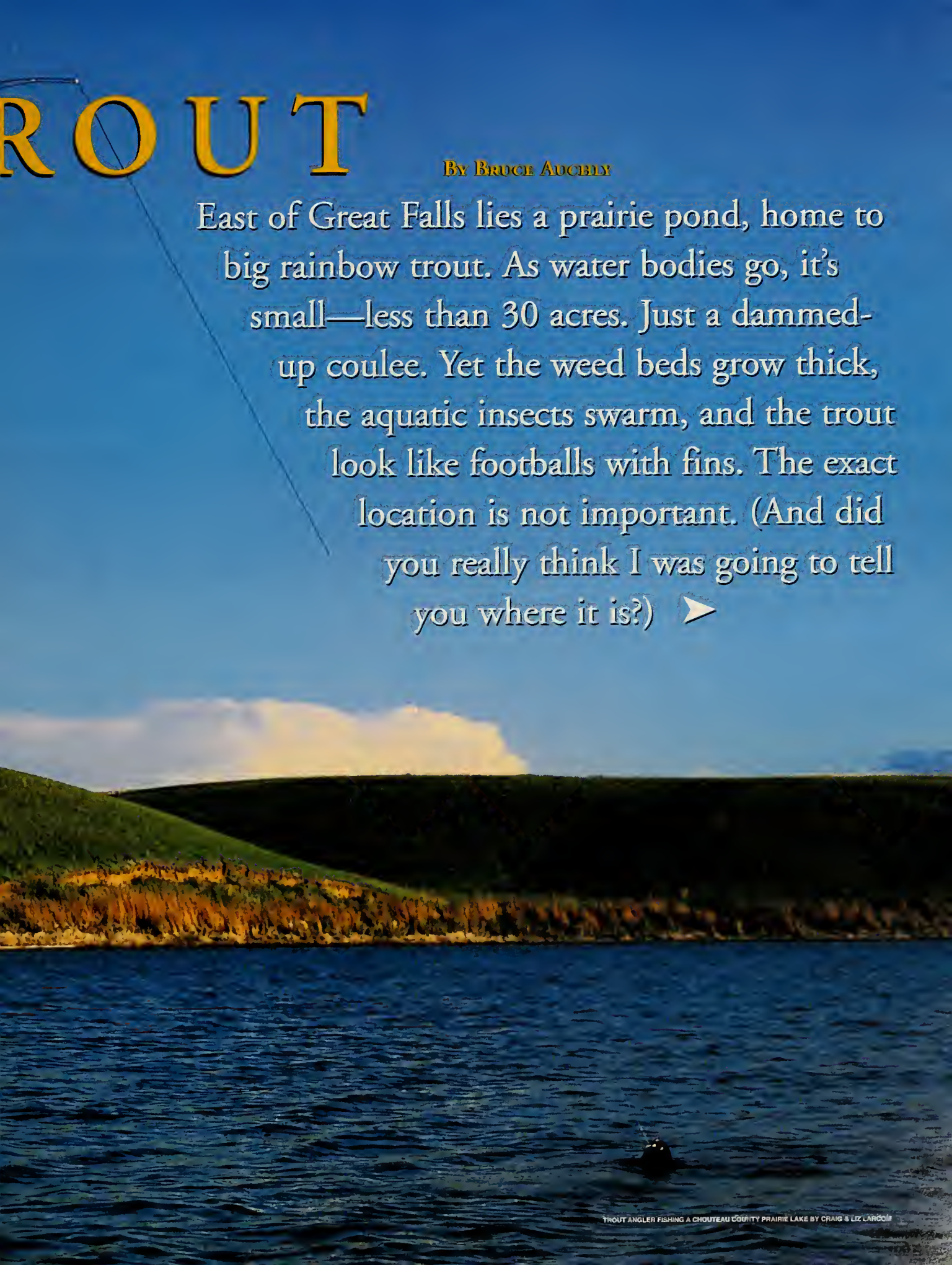
Why some of the West's biggest rainbows grow on prairies where bison herds once roamed



ROUT

By Bruce Auchly

East of Great Falls lies a prairie pond, home to big rainbow trout. As water bodies go, it's small—less than 30 acres. Just a dammed-up coulee. Yet the weed beds grow thick, the aquatic insects swarm, and the trout look like footballs with fins. The exact location is not important. (And did you really think I was going to tell you where it is?) ➤



TROUT ANGLER FISHING A CHOUTEAU COUNTY PRAIRIE LAKE BY CRAIG & LIZ LARCOM

CRAIG & LIZ LARCOM

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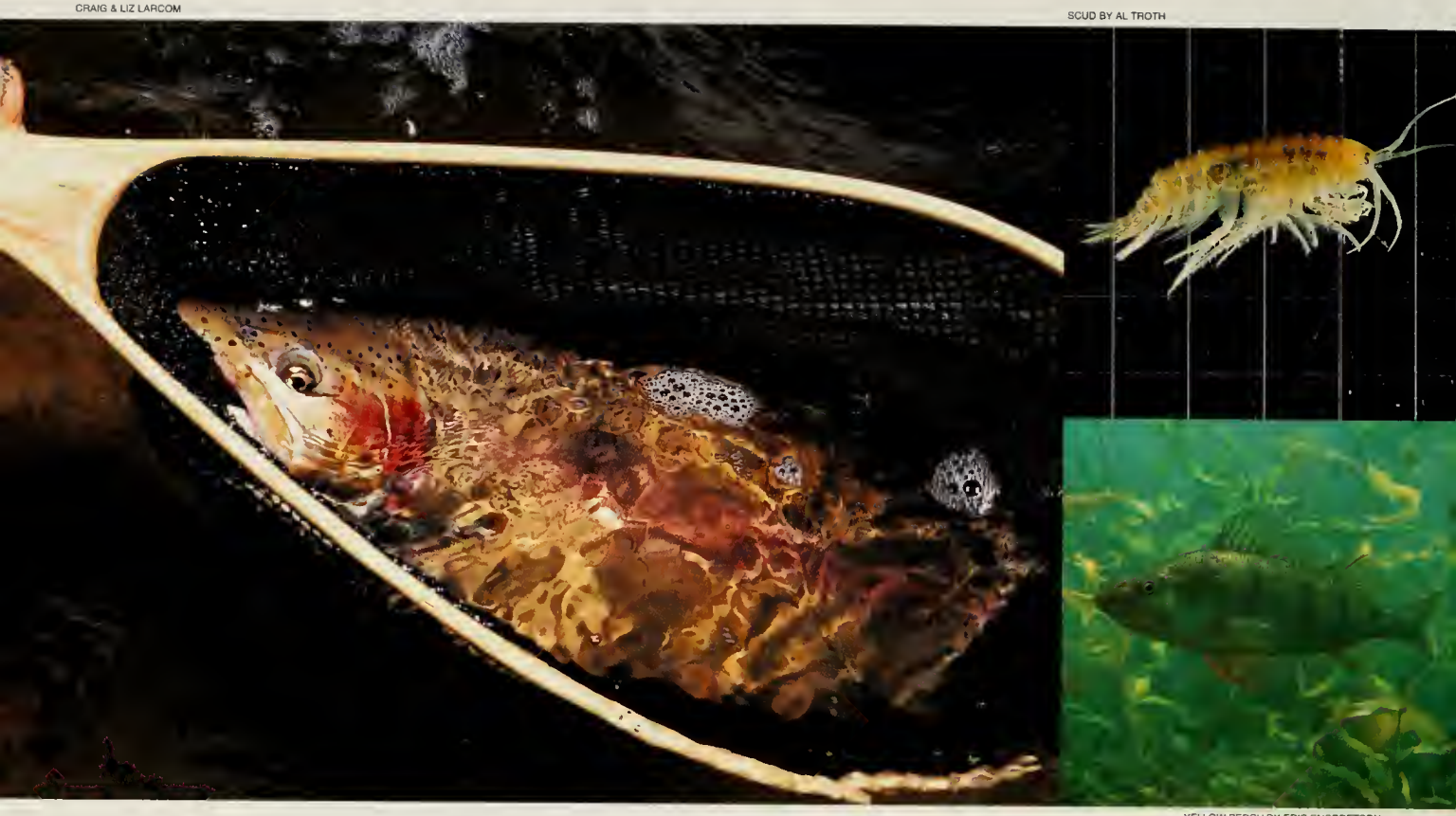


YELLOW PERCH BY ERIC ENGBRETSON

ADDING TROUT: The equation for producing jumbo prairie rainbows starts with soil that sees little rainfall to wash away imbedded nutrients. When water is added to prairie basins, algae and other aquatic vegetation bloom, feeding tiny freshwater shrimp, called "scuds," which in turn fatten planted rainbows. Thwarting the equation are illegally stocked minnows and perch, which rob food from trout and overpopulate the pond.

The pond could be almost anywhere in Montana east of the Rockies. Due to a combination of rich soil and dry, warm weather, much of this region is capable of growing trout weighing 3 pounds, 5 pounds, and even larger.

"It's simple," says Steve Leathe, Fish, Wildlife & Parks (FWP) regional fisheries manager in Great Falls. "Just add water."

And, of course, trout.

Pick a coulee. Fill with water. Add fish. As long as there's periodic trout stockings and water deep enough so the fish don't die from lack of oxygen in winter, the path to a trophy fishery is clear.

What follows, then, is a fish story. Not how to build a pond, or where to find one. Rather, why and how fish get to be so big on Montana's high plains.

Bruce Auchly, an FWP information officer based in Great Falls, is a frequent contributor to Montana Outdoors.

Locked in the soil

The origin of Montana's large prairie trout actually begins in the sky, says retired University of Montana geology professor Dave Alt. "In a wet climate, the rain washes down through the soil and rinses all the fertilizer out," says Alt, co-author of *Roadside Geology of Montana*. "But here you've got a very dry climate, which means the nutrients for plant growth are locked in the soil."

Hundreds of millions of years ago, this region of the North American continent was covered with a vast, shallow sea. The bottom of that ocean, like most water bodies, became thick with layers of sediment composed of sand and mud. Eventually, the sea dried up, and the sediment turned to sedimentary rock, which trapped nutrients such as potassium, calcium, magnesium, and phosphate.

Over time, says Alt, weather and climate broke down the rock into soil. Then, about 75 million years ago, the rise of the Rockies left that soil in a dry rain shadow, preventing the nutrients from leaching out. Nowadays, the addition of just a little water will cause almost anything to grow in central and eastern Montana.

"There is a wealth of fertilizer and nutrients out there ready to go into any plant," Alt says.

Many people traveling across eastern Montana consider it a wasteland due to the lack of lush vegetation. They're mistaken, says Alt.

"The bison once ate nutritious grass here and grew fat on it," he explains. "And Montana wheat has a very high protein content, which is why it commands a premium price."

Regardless of how prairie ponds are created—whether by people or by nature—the combination of water, soil, and summer sun provides the perfect growing conditions for aquatic vegetation. Stocked rainbow trout grow fat on the wide variety of insects attracted to

the plants, such as algae, which are magnets for scuds.

Scuds are tiny freshwater shrimp. An exceptionally large one measures about one-half inch long. But they are filet mignon to trout. In addition to scuds, a healthy prairie pond ecosystem comes loaded with damselflies, leeches, and water boatmen.

A mess of minnows

As simple as it is to grow big trout, however, it's equally simple to mess up a trout pond. Several years ago on a warm, late May day, I accompanied a group of sixth-graders on a school outing. Their teacher had received permission to visit and fish a local farmer's trout pond. As the kids fished, I asked the farmer about the minnows I'd noticed swimming in the shallows. He said he put them in to feed the trout.

It's a common practice but usually a big mistake.

A pond is like a pasture. And every pasture—even one irrigated and warmed by Montana's hot summer sun—has a limit as to what it can produce. A pasture

Catching Footballs

Fishing prairie trout ponds can be as simple or complicated as an angler wants to make it. Toss out a simple worm-and-bobber combination, or lug in a portable fly-tying kit and match the hatch right there on shore. The most frustrating technique may be casting and retrieving a spinner through a pond thick with vegetation—a guaranteed way to foul or lose a lure.

Fly-fishing, already a challenge, requires even more specialized equipment for prairie ponds.

"I'd use a 9- to 9 1/2-foot rod," says Boyd Wolverton, owner of Wolverton's Fly Shop in Great Falls. "Especially if you are in a float tube."

Float tubes. An angler standing on shore with an inner tube around his or her waist, wearing flippers, looks as ridiculous as a bronc rider in a pink chiffon housecoat. But once in the water, that float tube–ensconced angler has the ability to out-fish any shore-bound person. Float tubes allow anglers to cover more water, and to reach deeper water, than they could fishing from land.

The mechanics of fly-fishing require the angler to lift the line off the water and create a loop on the back cast. That's tough enough on land but even harder in a float tube, where the angler's arms are nearly at the water surface. A longer rod, say 9 1/2 feet rather than the 8 feet common for streams, allows for an easier line lift and a higher back cast when the water surrounds an angler's waist.

Wolverton also suggests a sink-tip or an intermediate-sinking line, either one matched with at least a 7-weight rod. An 8-weight or even a 9-weight fly rod, made for salmon or steelhead fishing, would be better. "You take a 4- or 5-weight rod with a sinking line, and that's a lot of pressure on that rod," he says. Too much pressure can stress a graphite rod to the point of breaking. A big rod "also lets you get that fish in faster, so you don't stress the fish," he adds.

When using a big, heavy rod with a sinking line, Wolverton advises adding a short and stout leader: no more than 9 feet long and 2X or 3X in diameter.

Great Falls angler Roland "Spider" Lencioni has simple, effective pond gear perfected from decades of fishing the fabled ponds of the Blackfeet Reservation. "I use a 9 1/2-foot rod with an 8/9-weight sinking line," he says. "I also use a leader that's 8- to 12-pound test and 4 feet long."

Lencioni doesn't waste time fishing topwater flies. "I fish the bottom all the time," he says. "It sounds crazy, but I'll tell you, it works for me."

For flies, every pond angler needs scud (freshwater shrimp) patterns. Wolverton's fly box also contains Woolly Buggers and patterns imitating leeches and water boatmen. He also throws in a few mayfly and grasshopper patterns. "And I use lots of bead heads for weight," he says.

Lencioni fishes with many of the same patterns that Wolverton uses, especially the big leeches. "I also use damselflies and girdle bugs," Lencioni says. "And I weight my flies."

If you haven't figured it out by now, Lencioni likes to fish deep, where the biggest rainbow trout spend most of their time. "I catch fish," he says, "and that's the fun part."

Fishing the Blackfeet Reservation requires a tribal license but not a Montana state fishing license. Currently, the price for a non-tribal member is $60 for a one-year or $25 for a daily license, but prices could change this spring.

For more information, call the Blackfeet Fish and Game Department at (406) 338-7207.

Off the reservation, anglers need a state license when fishing a public water body or a private pond stocked by the state.

"SPIDER" LENCIONI

"Spider" Lencioni

with too many cattle gets overgrazed fast. Similarly, a trout pond can have too many mouths and not enough food. A pond—even one thick with productive weed beds—can produce only so many insects. And rainbows need insects.

Unlike brown trout, which switch to eating minnows when they get big, most Montana rainbow trout stick to an insect diet no matter how large they grow. Because minnows also eat insects, stocking them in a trout pond usually results in too many fish "overgrazing" the food. The trout and minnows vie for the biggest, most nutritious bugs, such as scuds and water boatmen. Eventually, like cows in a slicked-off pasture, the trout can't find enough food to grow big and maintain their weight.

The final indignity to trout is their inability to reproduce in a pond. "Trout need a good flowing stream with gravel beds for spawning," Leathe says. That's something ponds lack. Other fish not only out-compete trout for food, but they also can spawn in ponds.

Most minnows that people catch and transport are actually various sucker species, which replicate well in a pond ecosystem. Yellow perch are also a favorite of those who stock illegally, usually in a futile attempt to start a new fishery. The problem is that when perch strip a pond of food, they don't stop reproducing. The result becomes skinny trout and stunted perch.

Illegal perch

For a tale of a trout pond ruined, look to Buffalo Wallow Reservoir, a remote northern Fergus County water body about 20 miles from the pavement. In the late 1980s, someone illegally planted yellow perch in this eight-acre pond, which FWP had been successfully stocking with trout since 1972. When FWP fisheries crews netted Buffalo Wallow in 1986, they found no yellow perch. Their first hint of a problem came two years later with the netting of three perch, all over 11 inches long.

"The rainbow were still doing reasonably well," says Anne Tews, FWP fisheries biologist in Lewistown. "But things went downhill from there."

Over the next six years, the perch population skyrocketed. In 1994 Tews set three fish traps and caught an estimated 15,000 perch, all 2 to 7 inches long. It was a textbook case of an overpopulation of stunted fish, Tews says. In September that year, she was forced to "reclaim" the pond, using a substance that suffocates fish but doesn't injure plants or birds.

"I walked around the pond a few days afterwards and estimated there were 100,000 dead yellow perch," Tews says. "Only five were bigger than 12 inches." She later restocked the pond with trout, which today thrive without competition from perch.

For trout pond success stories, consider those in the Blackfeet Reservation. Spreading from the mountains on the eastern edge of Glacier National Park, the reservation contains dozens of prairie ponds and lakes renowned for big rainbows. Anglers from across the state and around the world travel to the reservation each year.

"You kinda get addicted to catching those big fish," says Great Falls angler Roland "Spider" Lencioni, who has spent the last 20 years fishing the reservation in a float tube using a beefy fly rod and weighted fly line to get weighted nymphs to fish holding along the bottom of lakes. Fly-angling artistry it's not, but Lencioni's technique does catch fish—some up to 10 pounds (see sidebar, page 33).

Ira Newbreast, director of the Blackfeet Reservation Fish and Game Department, says the reservation's trout are big for one reason: "It's food production—all those scuds, those freshwater shrimp. We also have damselflies and leeches, but basically it's the scuds."

The reservation stocks about two dozen lakes each year. The rainbow trout, which average 5 inches long when planted, grow a remarkable 7 to 8 inches each year.

"That's all due to the food production," Newbreast says.

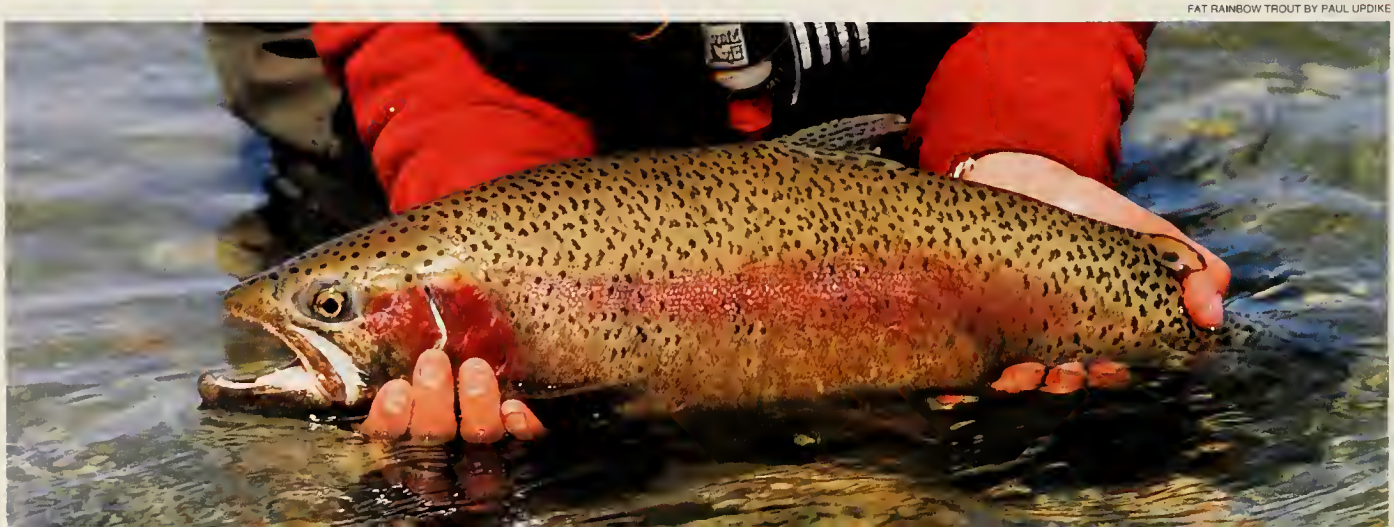
That phenomenal trout growth rate reels in close to 4,000 non-tribal anglers every year, making the fishery a huge moneymaker for Newbreast's agency. "It's really the cornerstone of our department's budget," he says.

Buffalo once roamed throughout the northern and eastern Montana prairies, feeding on the rich grass growing there. Today the great herbivores are gone, but another prairie resident is appearing in the region, making use of the abundant nutrients locked in the dry soil.

Just add water, stock trout, and keep out the minnows and perch. The result: big, beefy rainbows.

"It's not hard to do," Newbreast says. ■

FAT RAINBOW TROUT BY PAUL UPDIKE



State Parks 2002 Events Calendar

"YOU GO FIRST, DAD": The 5th Annual Cardboard Cup Regatta—in which cardboard boats race (for a few yards at least)—launches at Spring Meadlow Lake State Park on July 13.

JEREMY PUCKETT

MAY

11 Canoe/Kayak Demo Day, *Spring Meadow Lake State Park.* Try the latest designs in canoes and kayaks. (406) 449-8864 ext. 154.

11 Family Fun Day, *Giant Springs State Park.* Two interpretive walking tours, 1–2 p.m. Audubon bird watching clinic, kite flying, and fishing with rods and reels provided by FWP. Visitors get free access to the park all day. (406) 454-5858.

18–19 Motor Boat Testing, *Lake Elmo State Park.* 8 a.m.–5 p.m. Motor boat owners can test engines for the upcoming summer season. No extended excursions will be permitted; short runs only. This is the only time motor boats are allowed on Lake Elmo. (406) 247-2955.

24 (through August 30) **Summer Campfire Programs,** *Lewis and Clark Caverns State Park.* 8–9 p.m. (406) 287-3541.

24 Wild About Bats, *Lewis and Clark Caverns State Park.* 8–9 p.m. Learn all about these fascinating winged mammals. (406) 287-3541.

25 (through Sept. 2) **Guided Tours and Saturday Lecture Series,** *Bannack State Park.* Guided tours for visitors through the first territorial capital of Montana, now a ghost town. The Saturday Lecture Series covers a variety of interesting topics. (406) 834-3413.

31 Lewis and Clark in Montana, *Lewis and Clark Caverns State Park.* 8–9 p.m. (406) 287-3541.

JUNE

1 Tipi Raising, *Ulm Pishkun State Park.* Help students from the Great Falls public schools Indian education course raise tipis they made during the school year. (406) 866-2217.

7 The Tipi, *Lewis and Clark Caverns State Park.* 8–9 p.m. Learn the history of tipis and how to build and erect these portable lodgings of the historic West. (406) 287-3541.

8 (through August 31) **Summer Speaker Series,** *Missouri Headwaters State Park.* 7–8 p.m. Themes ranging from Montana and cultural history, to Lewis and Clark and natural science. Marshmallow roast social afterwards. (406) 994-6934.

8 Buzzard Day, *Makoshika State Park.* A day of picnics and games to welcome the buzzards back to Makoshika. (406) 365-6256.

8–9, 15–16 Hide Tanning the Old-Fashioned Way, *Ulm Pishkun State Park.* Learn the traditional method of tanning deer and elk hides each weekend. (406) 866-2217.

11 (through August 27) **Spring Meadow Lake Discovery Days,** *Spring Meadow Lake State Park.* Various interesting and educational programs for the entire family. (406) 449-8864 ext. 154.

14, 15, 16 Native American Cultural Fair, *Ulm Pishkun State Park.* (406) 866-2217.

14 Tales of the Fur Trade With "Joseph LaBonte," *Lewis and Clark Caverns State Park.* 8–9 p.m. Meet "Joseph LaBonte" at this living history program and hear tales of his colorful and unique lifestyle. (406) 287-3541.

21 The Rest of the Stories of Lewis and Clark, *Lewis and Clark Caverns State Park.* 8–9 p.m. Dr. Hal Stearns from the University of Montana and the Montana Committee for the Humanities. (406) 287-3541.

22 Preservation of Native American Language and Culture, *Missouri Headwaters State Park.* 7–8 p.m. Germain White, program manager for the preservation of cultural resources of the Salish and Kootenai tribes, talks about preserving American Indian language and culture. (406) 994-6934.

22 (Saturday evenings though August 31) **Campfire Talks, Hauser Lake,** *Black Sandy State Park.* (406) 449-8864 ext. 154.

23 Dale Tash Montana History Day, *Bannack State Park.* Lectures, tours, and demonstrations on the history of Bannack, Montana's first territorial capital. (406) 834-3413.

23 Nez Perce and the Bison, *Ulm Pishkun State Park.* Josiah Pinkham, Nez Perce cultural director, will provide a presentation about the relationship of the Nez Perce Tribe to the bison. (406) 866-2217.

JEREMY PUCKETT

WHOA! Free stagecoach rides at Bannack Days, Bannack State Park, July 21-22.

27 Lewis and Clark: Explorers and Physicians, *Missouri Headwaters State Park.* 7–8 p.m. Dr. Ron Loge, physician and Lewis and Clark historian, discusses the medical knowledge and skills employed by Lewis and Clark as they endured various physical hardships during their journey. (406) 994-6934.

28 River Quest of Lewis and Clark, *Lewis and Clark Caverns State Park.* 8–9 p.m. Carla Wambach, environmental educator, discusses the explorers' river journey. (406) 287-3541.

29 Montana Lewis and Clark Bicentennial Planning, *Missouri Headwaters State Park.* 7–8 p.m. Clint Blackwood, director of the Montana Lewis and Clark Bicentennial, will discuss the progress of Montana Lewis and Clark Bicentennial planning events. (406) 994-6934.

JULY

6 Montana History Weekends: Living History Events in Montana, *Missouri Headwater State Park.* 7–8 p.m. Dave Conklin, retired park ranger and historic preservation planner, will talk about where to go in Montana to enjoy a weekend surrounded by history. (406) 994-6934.

7 Spring Meadow Lake Triathlon, *Spring Meadow Lake State Park.* Competitors swim, bike, and run for fun and glory at this annual event. Ann Seifert, (406) 449-7644.

12 Montana's Reptiles and Amphibians, *Lewis and Clark Caverns State Park.* 8–9 p.m. FWP herpetologist Walt Timmerman will discuss the fascinating habits and behaviors of frogs, toads, salamanders, lizards, turtles, and snakes. Kids will love to see and touch the live species. (406) 287-3541.

12 Headwaters Relay: A Run to the Source, *Missouri Headwaters State Park.* Teams of five to ten runners will race through the night from Three Forks to the finish line at Red Rock Pass on the Continental Divide. Register by contacting Don Demetriades, 147 Hitching Post Road, Bozeman, MT 59715, (406) 539-0368, DODEMET@aol.com

13 Lewis and Clark in the Headwaters Valley, *Missouri Headwaters State Park.* 7–8 p.m. Jack Taylor, author, historian, and retired Montana State University professor, will talk about Lewis and Clark while they were in the Headwaters Valley. (406) 994-6934.

13 Cardboard Cup Regatta, *Spring Meadow Lake State Park.* The 5th annual race with cardboard boats is fun for families and helps raise money for the new Wildlife Rehabilitation Facility and Nature Center. Register by calling (406) 449-8864, ext. 154.

19 Western Songs and Patriotic Tunes, *Lewis and Clark Caverns State Park.* 8–9 p.m. Music by the Pickin-hats, a youth band playing violins, mandolins, recorders, and bodhran drums. (406) 287-3541.

20 History of the Mountain Men, *Missouri Headwaters State Park.* 7–8 p.m. Kurt Cunningham, FWP Education Bureau chief, discusses the lives of Montana mountain men. A favorite of kids and adults. (406) 994-6934.

21-22 Bannack Days, *Bannack State Park.* Turn back the clock to the 1800s during two fun-filled days for the entire family. Food, activities, old-fashioned plays, music, and other entertainment. (406) 834-3413.

20 Crow Life Ways, *Chief Plenty Coups State Park.* 1:30–3:30 p.m. Demonstrations of cultural traditions, practices, and skills, including native crafts, stories, songs, dance, and music of the Crow Indians. (406) 252-1289.

20 Bicycle Hell Climb, *Pictograph Cave State Park.* Part of the Big Sky State Games. (406) 254-7426; www.bigskygames.org.

21 Big Sky State Games Triathlon, *Lake Elmo State Park.* Top athletes from throughout the state swim, bike, and run for fun and glory. Come cheer the participants and then spend the day at the park. (406) 247-2955, www.bigskygames.org

26 A Pioneer Legacy, *Lewis and Clark Caverns State Park.* 8–9 p.m. Diane Tipton, FWP information officer, will share her great-grandparents' diaries of their early homesteading years. Bring your grandparents and let them relive their younger days and enjoy heartfelt memories. (406) 287-3541

27 Crow Life Ways. *Chief Plenty Coups State Park.* 1:30–3:30 p.m. The second in a series of demonstrations of cultural traditions, practices, and skills. Native crafts, stories, songs, dance, and music of the Crow Indians. (406) 252-1289.

27 Fort Owen Day, *Fort Owen State Park.* A living history program with artists and historians. Tour the museum, walk the grounds of the old fort, enjoy a picnic, and relax in the setting of the Bitterroot Mountains. (406) 542-5531. ■

Montana Outdoors PORTRAIT

Yellow-headed Blackbird

(Xanthocephalos xanthocephalos)

By Ellen Horowitz

DONALD M. JONES

Few birds have names descriptive of their appearance, but the yellow-headed blackbird is one that wears its name boldly. Acquaintance with yellowheads, as they are commonly called, provides a visual treat, an audio surprise, and a springtime introduction to the world of marshes.

Range: Yellow-headed blackbirds breed throughout western North America, from the Midwest to the West Coast and from Canada to the southwestern states. In winter, these neotropical migrants travel as far south as southern Mexico. Found across Montana from April to November, yellowheads are easy to see and hear during their breeding season in May and June.

Look and Listen: Its bright yellow head, neck, and chest, jet-black body, and bright white wing patches make the flamboyant, robin-size male yellowhead unmistakable. The smaller and much less conspicuous female has a dull yellow face, throat, and breast, and a brown body. The bird's scientific name, *Xanthocephalos*, is Greek for "yellow head."

Unlike the melodic song of meadowlarks, another member of the Icterid family to which blackbirds belong, the yellowhead's song resembles a metallic buzz. This resonant sound adds to an unusual wetlands orchestra. It complements the rattling, whirring, croaking, booming, and gurgling notes and voices of other, more secretive avian marsh musicians, such as the Virginia rail and American bittern.

Ecology: "Yellow-headed blackbirds rely on deeper, permanent wetlands with tall emergent vegetation," says Dan Casey, Northern Rockies coordinator for the American Bird Conservancy. Casey notes that waterfowl management activities, which often target these lake-like marshes, indirectly benefit the nesting territories of yellowheads, one of the few songbirds using this habitat type.

Yellow-headed blackbirds, which are larger than their red-winged cousins, dominate in areas where both species live. Redwing blackbirds appear early in spring. They make use of all areas of the marsh until their larger cousins arrive. Then the yellowheads take over the prime real estate, chasing the redwings to less desirable areas where the water is shallower and vegetation shorter.

Nesting: Yellow-headed blackbirds establish colonies where dense cattails and bulrushes grow in 2 to 4 feet of water and where insect life is rich. Some colonies contain as many as 25 to 30 nests within a 15-square-foot area. Each adult male stakes his claim within the larger framework of the colony. A polygynous breeder, he mates with several females who nest within his territory.

The female weaves wet grass leaves around cattails and other tall aquatic plants to form a nest. As the basket-like structure dries, it pulls the supports taught. The nest hangs 10 to 30 inches above the deep water, where it and its occupants stay safe from prowling skunks, raccoons, and foxes. The tall, thick vegetation provides extra security by hiding the nest from northern harriers and other raptors.

Foraging: During the breeding season, yellow-headed blackbirds eat primarily insects and spiders. The birds glean these foods from the ground or plants, or they "hawk" (snatch with their mouth) them from the air. Seeds, including grain, form a major portion of the birds' diet during the rest of the year. Like all Icterids, the yellowhead has a strong, straight, pointed bill that it opens and closes with powerful jaw muscles. After inserting its bill into the ground or matted vegetation, the yellowhead forces the substrate apart to form a cavity. The behavior, known as "gaping," provides access to foods not easily reached by other animals.

During winter and the spring and fall migrations, yellow-headed blackbirds feed in freshly plowed lands, cultivated fields, and pastures. Although they cause some damage to agricultural crops by pulling up seedlings and eating grain, the harm is more than offset by the benefits these birds provide by eating insects and weed seeds. ■

Ellen Horowitz, a hiking guide and freelance writer, lives in Columbia Falls.

Cow, my sweet

Though elk mate in fall—as do deer, brown trout, and some other species—most wildlife conduct their courtship in spring. To find out why, turn to page 8. Photograph of elk at twilight by DenverBryan.com.

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